

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
11 July 2002 (11.07.2002)

PCT

(10) International Publication Number  
**WO 02/052977 A2**

(51) International Patent Classification<sup>7</sup>: **A45D 34/00**

(21) International Application Number: **PCT/DK01/00859**

(22) International Filing Date:  
21 December 2001 (21.12.2001)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
PA 2000 01945 29 December 2000 (29.12.2000) DK

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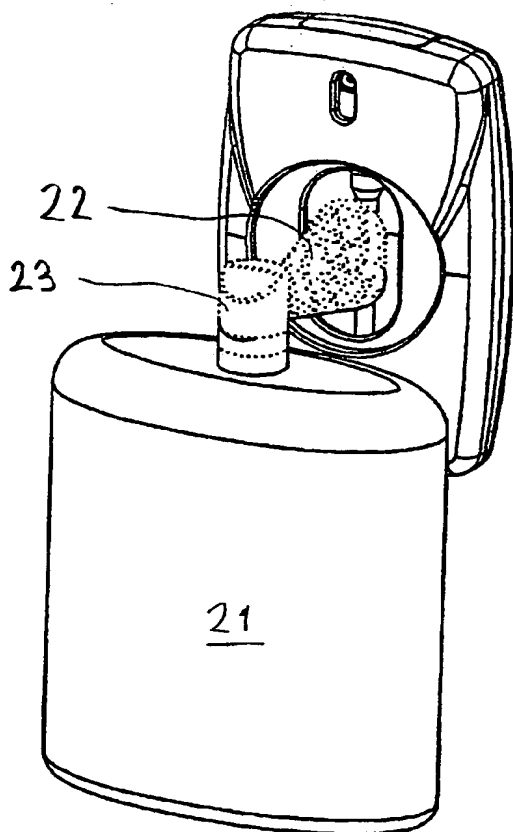
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(81) Designated States (*national*): AE, AG, AL, AM, AT, AU,  
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,  
CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,  
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,  
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,  
MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG,  
SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ,  
VN, YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM,  
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),  
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),  
European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR,  
GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent  
(BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR,  
NE, SN, TD, TG).

[Continued on next page]

(54) Title: **POCKET-SIZE REFILLABLE ATOMIZER BOTTLE**



(57) Abstract: Pocket-size atomizer bottle, in particular for perfume, having a substantially flat shape with a front (3) and back (4) and two narrow lateral faces interconnecting the front (3) and the back (4), and a refill opening to allow refilling of the bottle. The refill opening (1) is provided on the front (3) or back (4) of the bottle.

WO 02/052977 A2



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— *of inventorship (Rule 4.17(iv)) for US only*

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**Published:**

— *without international search report and to be republished upon receipt of that report*

Pocket-size refillable atomizer bottle.

Technical Field

The invention relates to a pocket-size atomizer bottle, in particular for perfume, having a substantially flat shape with a front and back and two narrow lateral faces  
5 interconnecting the front and the back, and a refill opening to allow refilling of the bottle.

Background Art

An atomizer bottle of the above type is also called a vaporizer and is used in particular for perfume. Due to its compact size the atomizer bottle is handy to carry in a pocket  
10 or in a bag. In its top the bottle is provided with a so-called atomizing pump having an atomizer head provided with a nozzle and a tubing extending into the bottle. When depressing the atomizer head liquid is sucked up through the tubing and discharged through the nozzle in a conical spray mist. The bottle may be refilled with perfume from a perfume bottle, which is too bulky and unhandy to bring along. It is also  
15 suitable for making own blends of perfume. In addition to perfume the bottle may for instance be used for mouth freshener, aftershave, deodorant, mosquito repellent and the like liquids.

Several atomizer bottles of the above type are known. US 5.492.248 discloses a pen-shaped perfume dispenser provided with a delivery device in one end and refill  
20 opening in the opposite end. One drawback of this perfume dispenser is the small refill opening, the maximum diameter thereof corresponding to the diameter of the pen rendering refilling of the bottle difficult.

German utility model No 8912131 discloses a pocket-size atomizer bottle provided with a replaceable, refillable liquid container. The replaceable container has a rather

small refill opening making spillage-free refilling of the container difficult.

French patent No 2.522.283 discloses a pen-shaped perfume dispenser provided with an atomizer head in its upper end and a refill opening in its lower end. However, also this refill opening is of a limited size making a fast and safe refilling difficult.

- 5 GB 2.229.380 discloses a pen-shaped perfume atomizer with a valve in its bottom. The pen-shaped perfume atomizer may be refilled in the same way as a lighter by removing the atomizing head on another perfume atomizer and inserting the stub thereof into the valve of the pen-shaped perfume atomizer. One draw-back of this perfume atomizer is that it is only suited for refilling by means of perfume atomizers  
10 with an atomizing mechanism, from which the atomizing head per se with the push button can be removed.

- Pocket-size atomizer bottles are also known, which may be refilled by removing the atomizing mechanism, but in addition to the above draw-back relating to the size of the refill opening, this atomizer is further encumbered by the drawback that the  
15 atomizer mechanism and the associated tubing may drip when dismounted.

US 1.914.319 discloses an atomizer adapted particularly for medicinal uses and provided with a casing wall, which is generally circular in a horizontal cross-sectional configuration, and a refill opening provided in the casing wall. One draw-back of this atomizer bottle is that it is not suited for being carried in a pocket due to its shape.

- 20 FR 540876 discloses a pocket-size atomizer bottle provided with a refill opening, said bottle having a substantially flat shape with a front and a back and two narrow side faces connecting the front and the back. The refill opening is provided in a transition area between one of the narrow side faces and the top. One draw-back of this atomizer bottle is that spillage-free refilling is difficult due to the small size of the refill  
25 opening.

Finally it is also known to use a small funnel for the refilling of small atomizer bottles.

### Brief Description of the Invention

- 5 The object of the invention is to provide a pocket-size atomizer bottle of the above type and which is particularly easy to refill.

According to the invention the atomizer bottle is characterised in that the refill opening is provided on the front or back of the bottle to allow for a large refill opening compared to the volume of the bottle, the size of the refill opening only  
10 being restricted by the dimensions of the front or back of the bottle. A large refill opening ensures that the atomizer bottle may be refilled by another, often larger, atomizer bottle, "the master bottle", having an atomizer head, the size of the refill opening ensuring that the entire conical flow of atomised liquid from the master bottle hits the opening provided the distance between the atomizer bottle and the  
15 master bottle is kept suitably short. Since spray mist moves in vertical direction during depression of the atomizer head on the master bottle, a refill aperture compensating for this movement is often needed as is the case with the atomizer bottle according to the invention. The atomizer bottle according to the invention is particularly applicable when the user blends her own perfume. It is thus possible to  
20 measure out a suitable amount of perfume A by depressing the atomizer head of the the master bottle A a specific number of times and then to measure out a suitable amount of perfume B by depressing the atomizer head of the master bottle B a specific number of times. It is also particularly advantageous that the atomizer heads and the associated tubing of one or more master bottles do not need to be removed,  
25 whereby spillage and waste of the often very expensive perfumes are avoided.

The flat shape of the atomizer bottle furthermore ensures that the bottle may be placed in a stable manner on a flat surface, eg on a tabletop, with the refill opening

facing upwards during refilling. This is particularly advantageous in that the risk of perfume escaping through the refill opening during handing of the master bottle hereby is reduced.

Finally according to the invention the atomizer bottle is particularly easy to clean, the  
5 interior thereof being flushed with water by holding the refill opening under a running tap.

According to an embodiment of the invention the refill opening may measure at least 14 mm in a first direction and at least 20 mm in a second direction which is perpendicular to the first direction. Tests have shown that in practice such minimum  
10 dimensions facilitate refilling of the atomizer bottle without significant spillage occurring.

According to an embodiment of the invention the refill opening may be an elongated aperture with rounded ends. The shape of such an aperture is substantially the same as the cross section of the conical liquid mist being displaced in the movement  
15 direction of the atomizer head of the master bottle.

According to an optional embodiment the cross section of the refill opening may be circular with a diameter of at least 20 mm. The mutual position of the atomizer bottle and the master bottles is less critical when this embodiment of the refill opening is applied.

20 The refill opening may be provided on the same side as the atomizer nozzle of the atomizer bottle.

The atomizer nozzle of the atomizer bottle may also be provided in one of the narrow lateral faces connecting the front and back of the bottle.

According to a further preferred embodiment the refill opening is provided in the bottom of a recess in the bottle wall. As a result atomized liquid slightly missing the opening, does not settle on the outer face of the atomizer bottle and may be led down into the opening.

## 5 Brief Description of the Drawings

The invention is explained in greater detail below with reference to two preferred embodiments illustrated in the drawings, in which

Fig. 1 is an exploded perspective view of a first embodiment of the invention,

Fig. 2 illustrates the same seen from a different angle,

- 10 Fig. 3 is a perspective view of the first embodiment of the invention in its assembled state,

Fig. 4 illustrates the same seen from a different angle,

Fig. 5 is an enlarged illustration of a vertical section through the first embodiment of the invention,

- 15 Fig. 6 is a diagrammatic view of the dimensions of the refill opening according to the first embodiment,

Fig. 7 shows the first embodiment of the invention during refill by means of a master bottle, and

Fig. 8 shows a second embodiment of the invention during refill by means of a master

bottle.

### Preferred Embodiments

Fig. 1 is an exploded perspective view of a first embodiment of the atomizer bottle according to the invention. In this embodiment the atomizer bottle comprises two injection moulded halves 19,20 and in its assembled state - the bottle is shaped as a flat square box with rounded side walls and corners. The bottle is provided with an atomizing mechanism 18, 10, 15, 11. The atomizer mechanism comprises a tubing 10 extending into the bottle, a pump 18, a push button 15 and an atomizer nozzle 11. The front 3 of the atomizer bottle is provided with an oval refill opening 1 which is placed in the bottom of a circular recess 17. The refill opening 1 may be closed by means of a capsule 6 provided with a sealing ring 8.

Fig. 2 is an exploded perspective view of the atomizer bottle seen from a different angle. It is further illustrated how the capsule 6 is provided with a locking pawl 7 of a shape corresponding to and being slightly smaller than cross section of the opening 1. When the capsule 6 engages the refill opening 1 in the closed position, the ends of the locking pawl 7 are inside of the bottle wall and turned up onto the locking faces 9 and retain the capsule in a secure sealing manner.

In Figs. 3 and 4 the atomizer bottle is shown in its assembled stated in an inclined rear view and in an inclined front view, respectively.

The longitudinal sectional view shown in Fig. 5 through the atomizer bottle in an enlarged scale clearly shows how the atomizer mechanism is arranged in the atomizer bottle and the position of the capsule 6 in the closed position. The halves 19, 20 are joined for instance by ultrasonic welding. The front half 19 to the left in Fig. 5 is provided with an elongated spray orifice 12, whose height corresponds to the stroke of the atomizer nozzle when the push button/the atomizer head 15 is depressed. The



atomizer mechanism has a profiled portion 14 sealingly fitting with an upper profiled portion 13 of the halves 19, 20. As can be seen, the sealing ring 8 of the capsule 6 is secured to the cover 6 behind a wedge-shaped projection 5. In the closed position shown in Fig. 5 the sealing ring 8 is forced into abutment with the bottom of the  
5 recess 17. The atomizer bottle may be opened to allow refilling thereof by placing a coin or the like in the slot 16 and turning the capsule 90°, whereby the locking pawl 7 is turned out of engagement to a position in which it can be led out through the opening 1. The atomizer bottle is then ready to be refilled.

Fig. 6 is a diagrammatic view of the shape of the atomizer opening 1. The oval refill  
10 opening has a height y of about 24 mm and a width x of about 14 mm.

Tests and measurement have shown that these dimensions enable refilling of the atomizer bottle by means of an atomizer head of a master bottle having a stroke or displacement of up to 10 mm without missing the refill opening. At a stroke of only 6 mm the height y can be set to 20 mm. An atomizer nozzle, which is kept at a  
15 distance of 25 mm and sprays a conical spray mist at a cone angle of 25°, covers an oval area of a width of about 11 mm and a height of about 17 mm at a nozzle stroke of 6 mm. If a margin of 1.5 mm is applied along the entire circumference, an oval refill opening of a width of 14 mm and a height of 20 mm is obtained.

Fig. 7 shows the atomizer bottle 1 during the refilling process, the capsule 6 having  
20 been removed. A master bottle 21, eg containing perfume, is arranged with its atomizer head 23 opposite the refill opening 1 of the atomizer bottle. The atomizer head 23 of the master bottle 21 discharges a conical spray mist 22 of atomized perfume, and the spray mist moves upwards and downwards with the atomizer head 23. The size and shape of the refill opening 1 ensure that all of the perfume is confined  
25 within the limits of the refill opening 1.

The example shown in Fig. 8 corresponds completely to the example shown in Fig.

7, another embodiment of the invention, however, being used, in which a circular refill opening is provided in the bottle wall instead of an oval opening.

Each of the embodiments of the atomizer bottle shown has a height of about 70 mm, a width of about 43 mm and a thickness of about 16 mm, resulting in a size, which  
5 readily fit into a pocket or in a small bag. Despite of the small size of the atomizer bottle, the bottle is provided with a comparatively large refill opening to facilitate the refilling of the atomizer bottle by means of a master bottle with a atomizer head. The draw-backs of the known refillable pocket atomizer bottles are thus avoided. Thus, the refilling method of pouring liquid from one bottle to another bottle is rendered  
10 superfluous, said method requiring great care to avoid spillage of the often very expensive perfume droplets and perfume smearing on the outer face of the bottle.

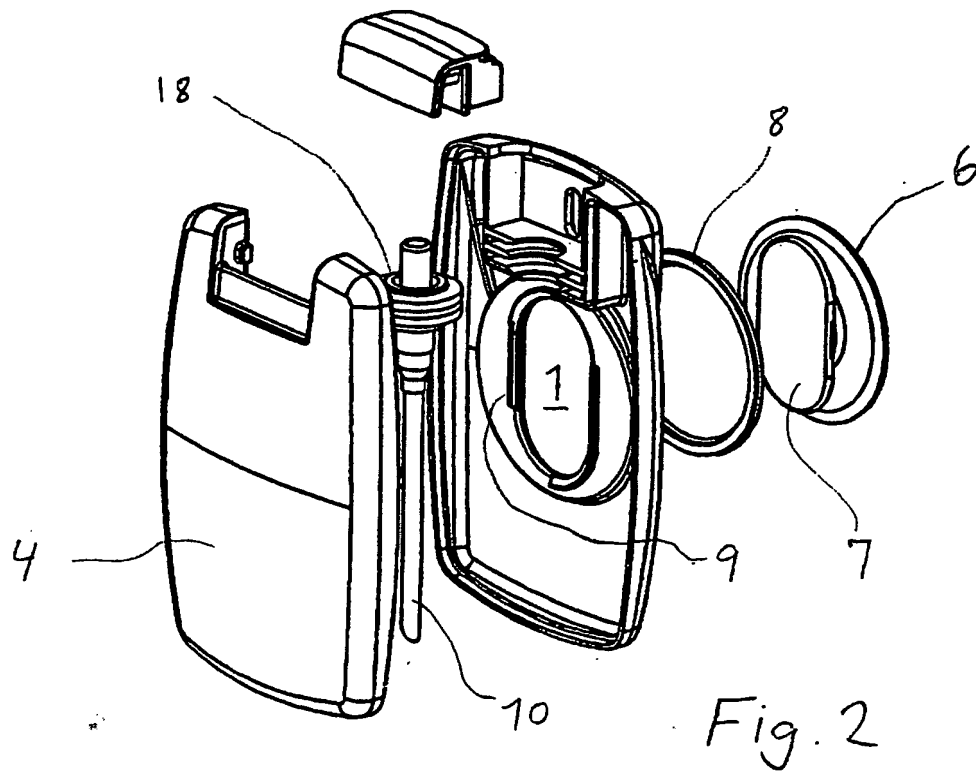
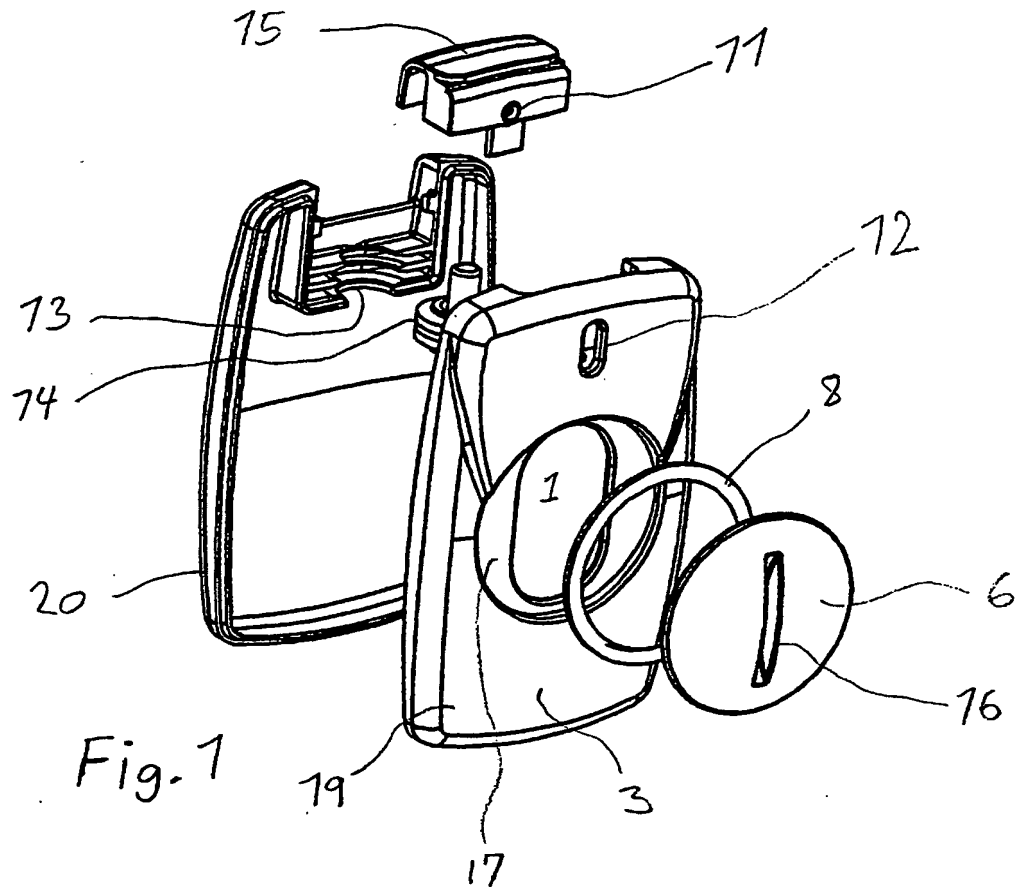
However, if it is necessary to pour liquid into the bottle, the bottle may be placed in a stable manner on a flat surface with the refill opening facing upwards.

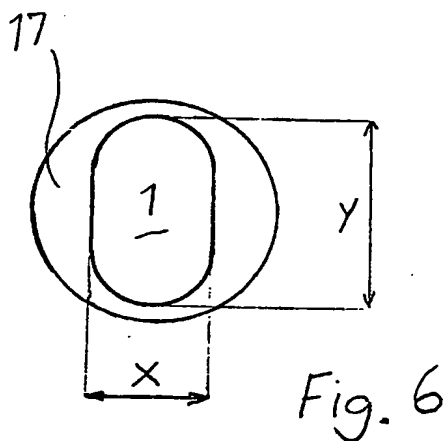
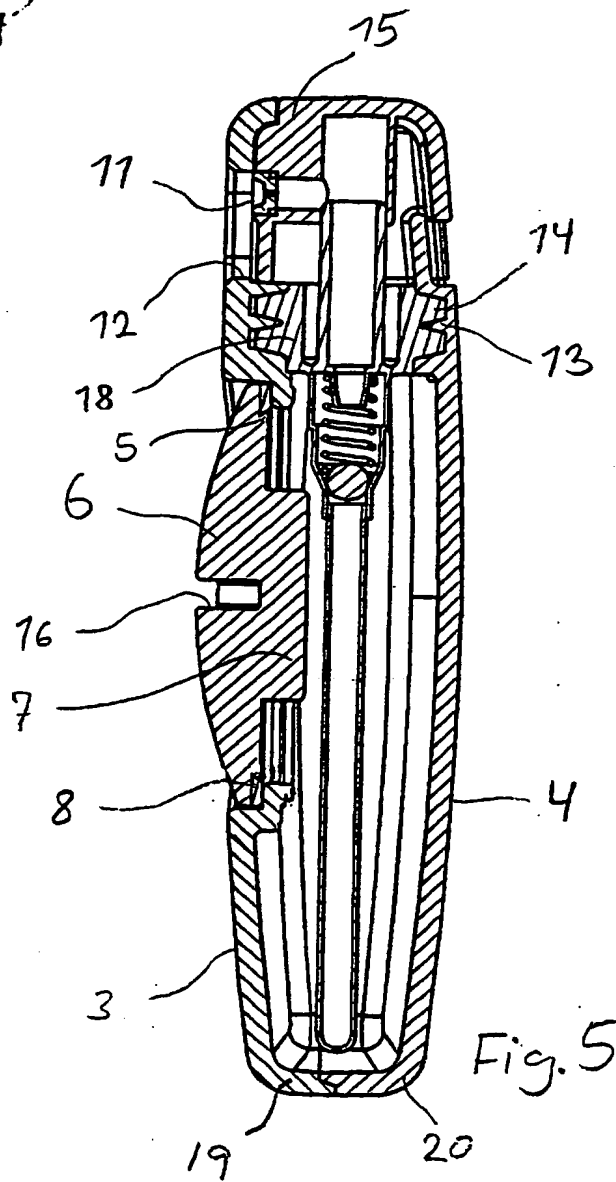
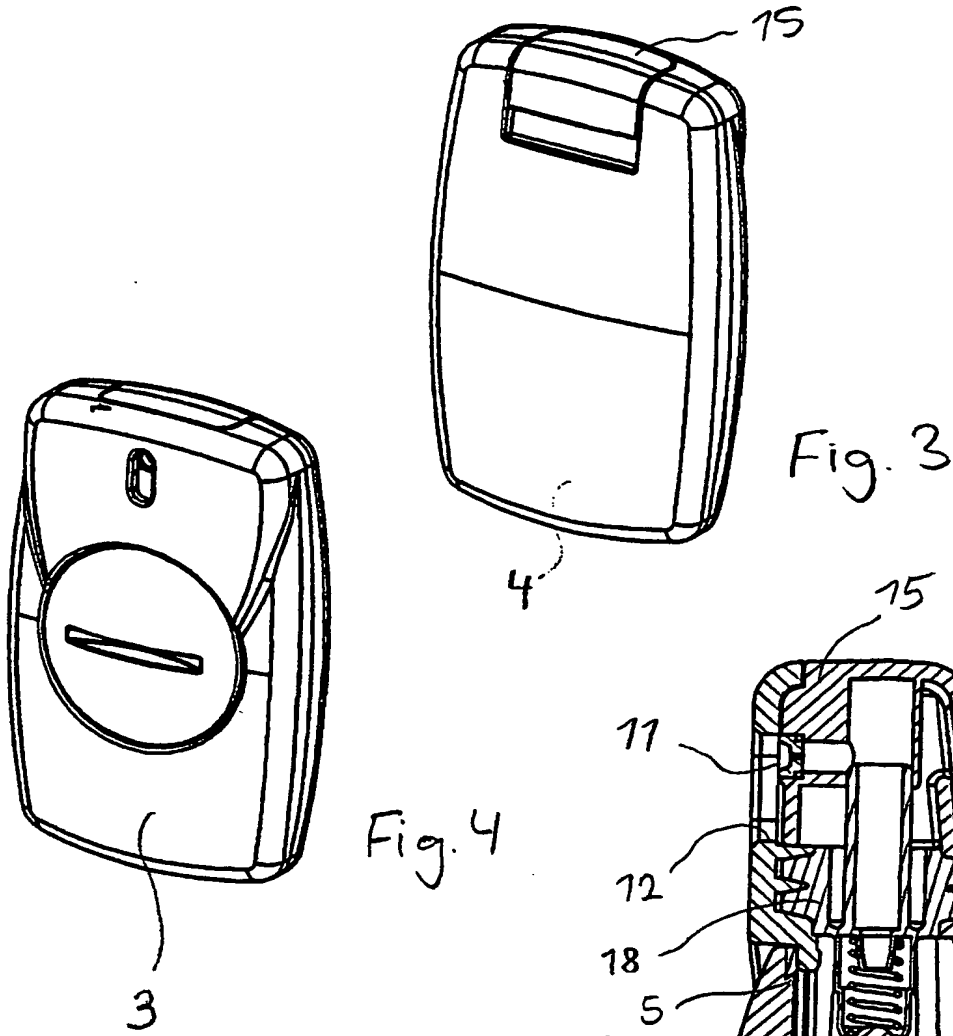
In addition to perfume the bottle may for instance be used for mouth freshener,  
15 aftershave, deodorant, mosquito repellent and the like liquids.

The atomizer bottle shown above is made of injection moulded plastics, preferably PEX. The invention is not restricted to this material, the bottle may also be made of for instance glass or metal.

Claims

1. Pocket-size atomizer bottle, in particular for perfume, having a substantially flat shape with a front and back and two narrow lateral faces interconnecting the front and the back, and a refill opening to allow refilling of the bottle, c h a r a c t e r i s e d i n  
5 that the refill opening (1) is provided on the front (3) or back (4) of the bottle.
2. Atomizer bottle according to claim 1, c h a r a c t e r i s e d in that the refill opening measures at least 14 mm in a first direction (x) and at least 20 mm in a second direction (y) which is perpendicular to the first direction (x).
3. Atomizer bottle according to claim 1 or 2, c h a r a c t e r i s e d in that the refill  
10 opening (1) is an elongated aperture with rounded ends.
4. Atomizer bottle according to claim 1 or 2, c h a r a c t e r i s e d in that the cross section of the refill opening (1) is circular with a diameter of at least 20 mm.
5. Atomizer bottle according to one of the claims 1-4, c h a r a c t e r i s e d in that the refill opening (1) is provided on the same side as the atomizer nozzle (11) of the  
15 atomizer bottle.
6. Atomizer bottle according to one of the claims 1-4, c h a r a c t e r i s e d in that the atomizer nozzle (11) is provided in one of the narrow lateral faces.
7. Atomizer bottle according to one of the preceding claims, c h a r a c t e r i s e d in that the refill opening (1) is provided in the bottom of a recess (17) in the bottle  
20 wall (3).





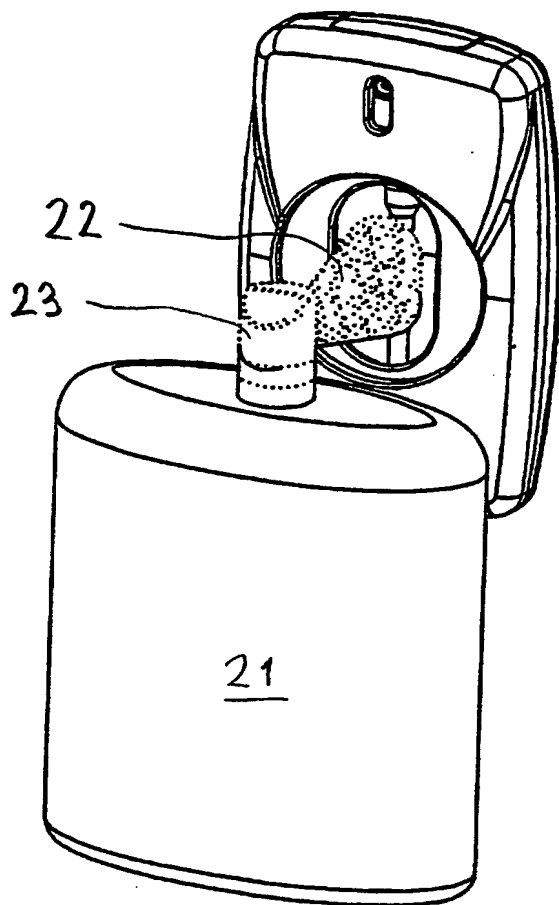


Fig. 7

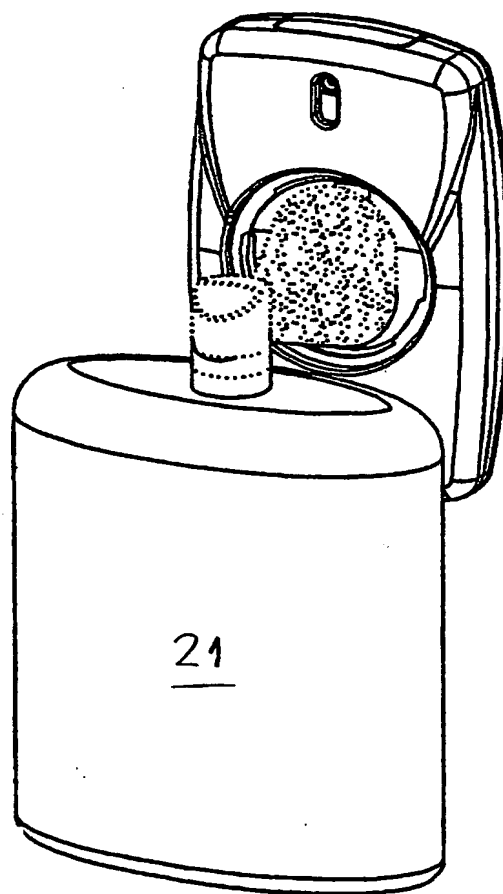


Fig 8

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
11 July 2002 (11.07.2002)

PCT

(10) International Publication Number  
**WO 02/052977 A3**

(51) International Patent Classification<sup>7</sup>: **A45D 34/00**,  
34/02

(21) International Application Number: PCT/DK01/00859

(22) International Filing Date:  
21 December 2001 (21.12.2001)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
PA 2000 01945 29 December 2000 (29.12.2000) DK

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vard, DK-1780 Copenhagen V (DK).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU,  
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,  
CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,  
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,  
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SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ,  
VN, YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM,  
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),  
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),  
European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR,  
GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent  
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NE, SN, TD, TG).

**Declaration under Rule 4.17:**

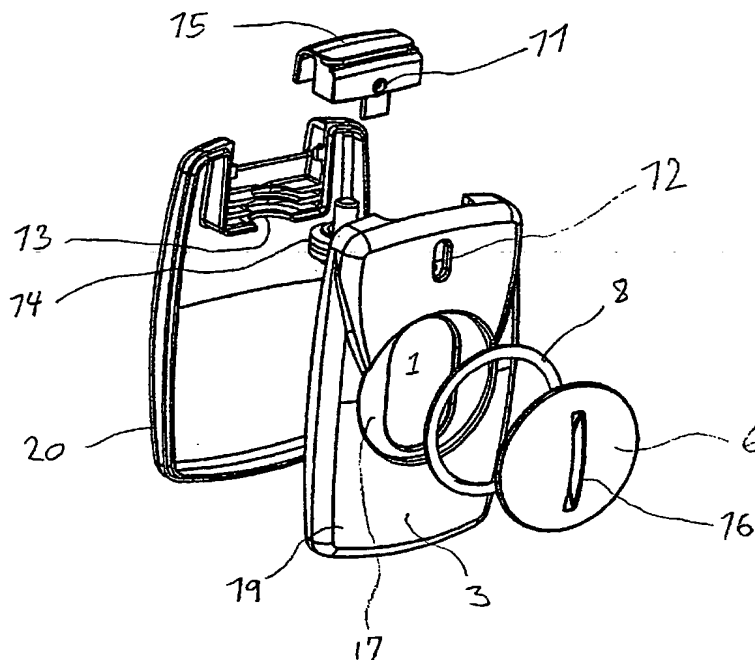
— of inventorship (Rule 4.17(iv)) for US only

**Published:**

— with international search report

[Continued on next page]

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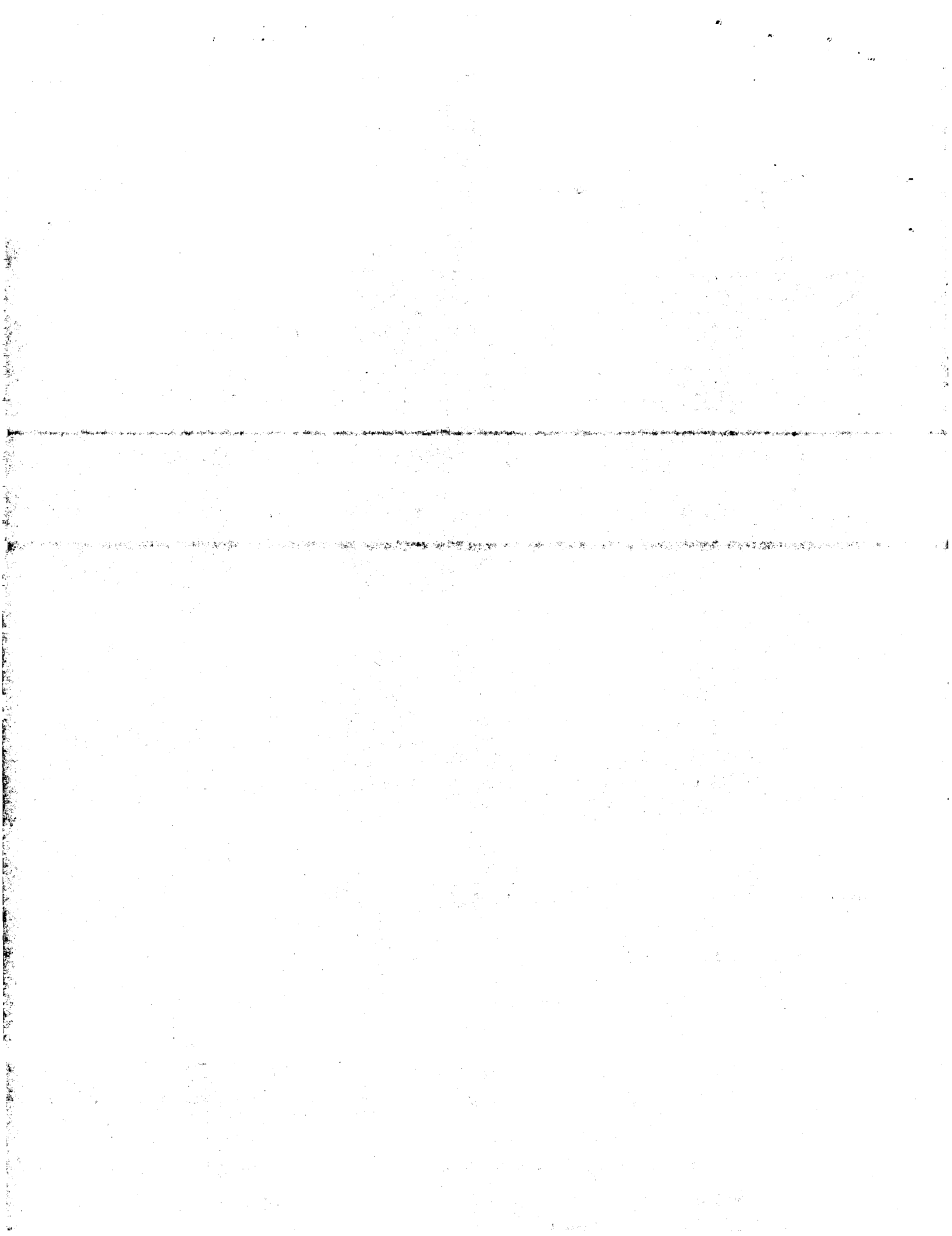






**(88) Date of publication of the international search report:**  
19 September 2002

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*



## INTERNATIONAL SEARCH REPORT

 International Application No  
 PCT/DK 01/00859

 A. CLASSIFICATION OF SUBJECT MATTER  
 IPC 7 A45D34/00 A45D34/02

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

 Minimum documentation searched (classification system followed by classification symbols)  
 IPC 7 A45D B05B A61M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

WPI Data, EP0-Internal

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 89 12 131 U (SCHEUERMANN B) 25 January 1990 (1990-01-25) figure 5 ---	1
A	FR 540 876 A (LAZARD MARCEL; RENON FERNAND; BONABEAU EMILE) 19 July 1922 (1922-07-19) figure 1 ---	1
A	FR 2 522 283 A (LAPORTE JEAN CLAUDE) 2 September 1983 (1983-09-02) figure 1, detail 7 ---	1
A	GB 2 229 380 A (WINTERFLOOD SIMON BERESFORD) 26 September 1990 (1990-09-26) figure 4 ---	1
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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26 March 2002

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02. 05. 2002

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## INTERNATIONAL SEARCH REPORT

International Application No  
PCT/DK 01/00859

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 492 248 A (ORTNER GEORG) 20 February 1996 (1996-02-20) column 3, line 1 - line 6 ---	1
A	US 1 914 319 A (ARONSON LOUIS V) 13 June 1933 (1933-06-13) figure 2 -----	1



## INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/DK 01/00859

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